Spliced Concrete Girder Projects

Continuous Spans

- Bow River Bridge, AB
- Main St. Viaduct, Pueblo, CO
- Rosebank-Patiki Interchange, NZ
- Palm Valley Bridge, FL
- Moore Haven Bridge, FL
- Route 33 Bridges, West Point, VA

Continuous Span Projects

Bow River Bridge, AB

- Built in 2002
- 4 spans: 2 at 174 ft, 2 at 213 ft
- One segment per span
- 211 ft beams weighed 268,000 lb.
- Beams 9.2 ft deep with 6.9 in. web
- 11.65 ft beam spacing
- Very high live load requirements
- Concrete saved 10% over steel girders

Bow River Bridge, AB

Longest known single piece girders shipped by truck at 211 ft long

Continuous Span Projects

Main Street Viaduct, Pueblo, CO

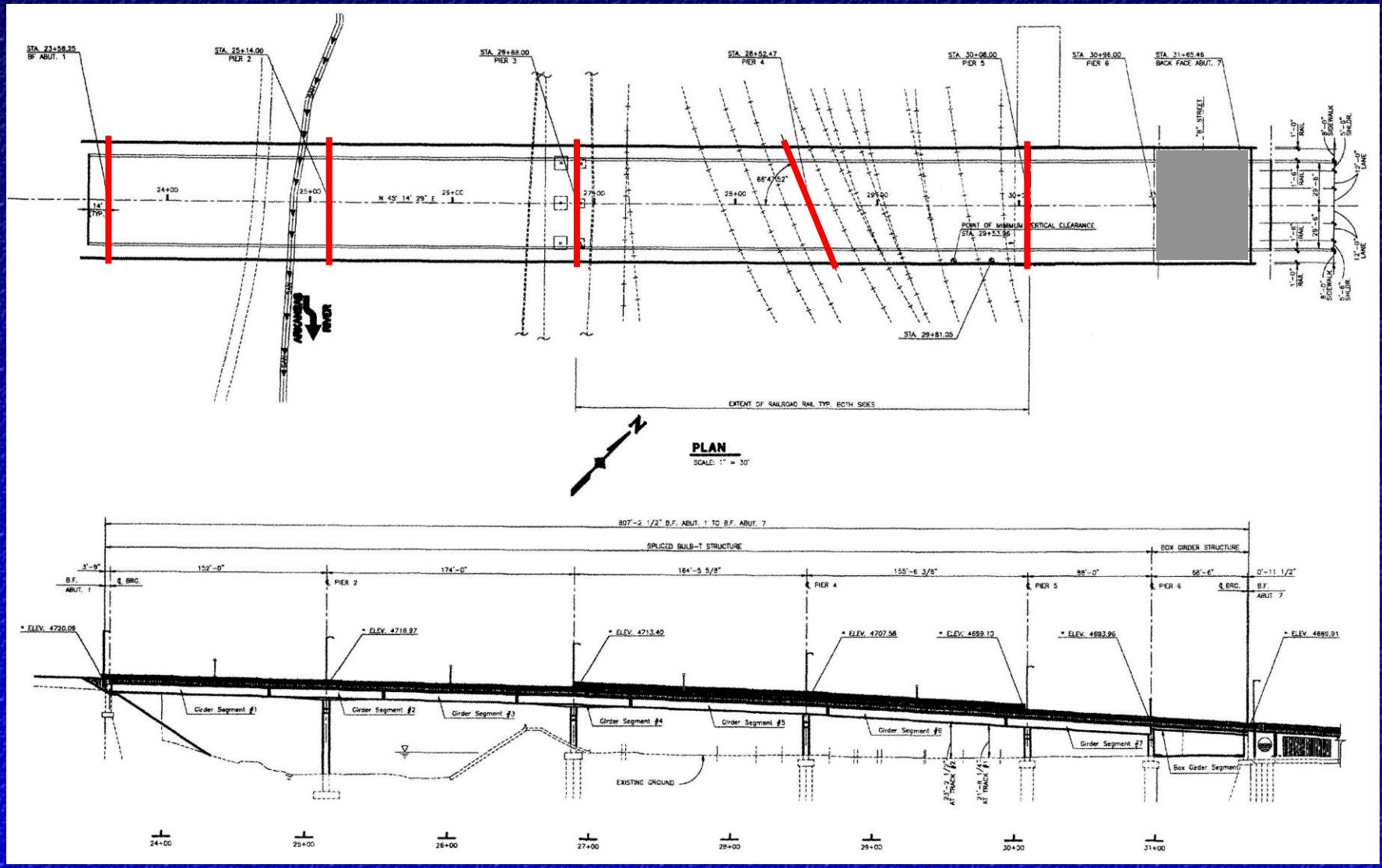
- Built in 1995
- 734 ft spliced girder structure
- 5 spans with 174 ft max. span
- 7 segments with 154 ft max.
- 72 in. deep girder haunched to 96 in. over 2 piers
- End block section used over 1 pier

Continuous Span Projects

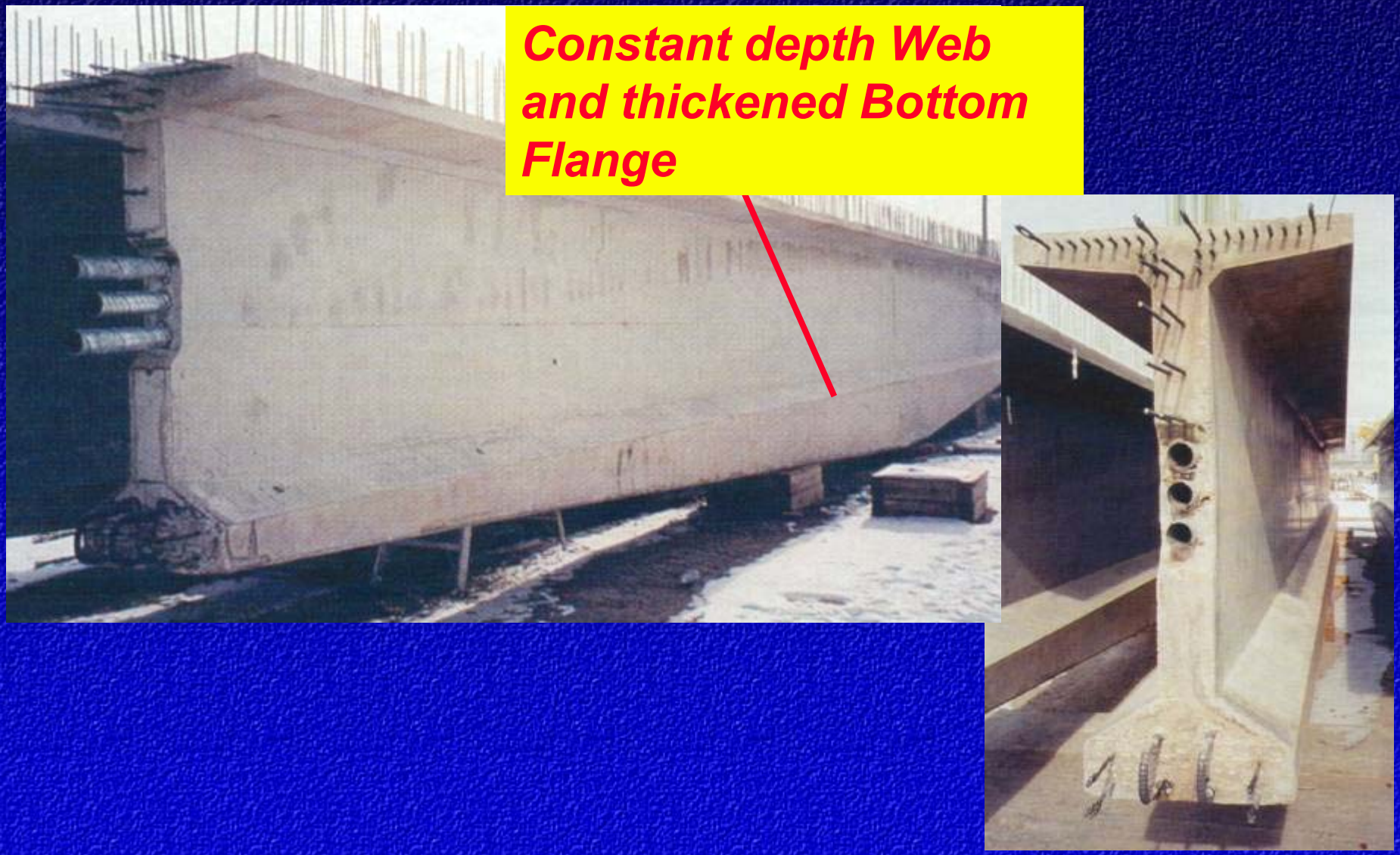
Main Street Viaduct, Pueblo, CO

- Erected on falsework & strongbacks
- Spliced to achieve greater spans with restricted pier placement
- Very tight schedule and budget
- Aesthetics, durability and low maintenance costs were considered
- 8 Girders spaced at 10'-6"
- Overall deck width = 80'-0"

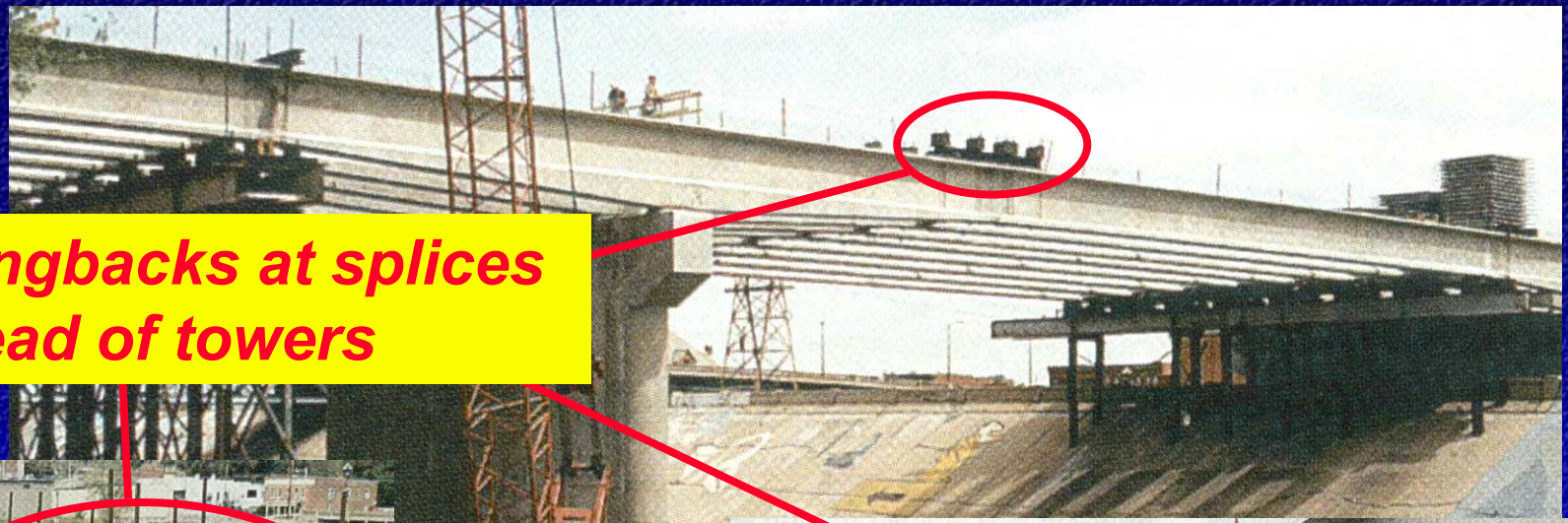
Main Street Viaduct, Pueblo, CO



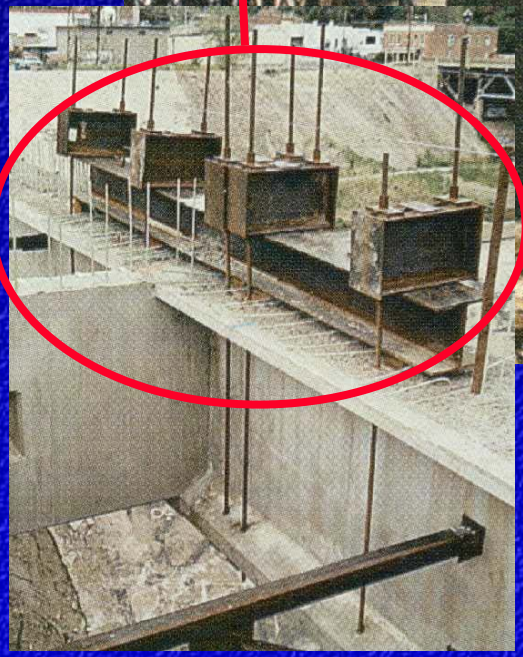
Main Street Viaduct, Pueblo, CO

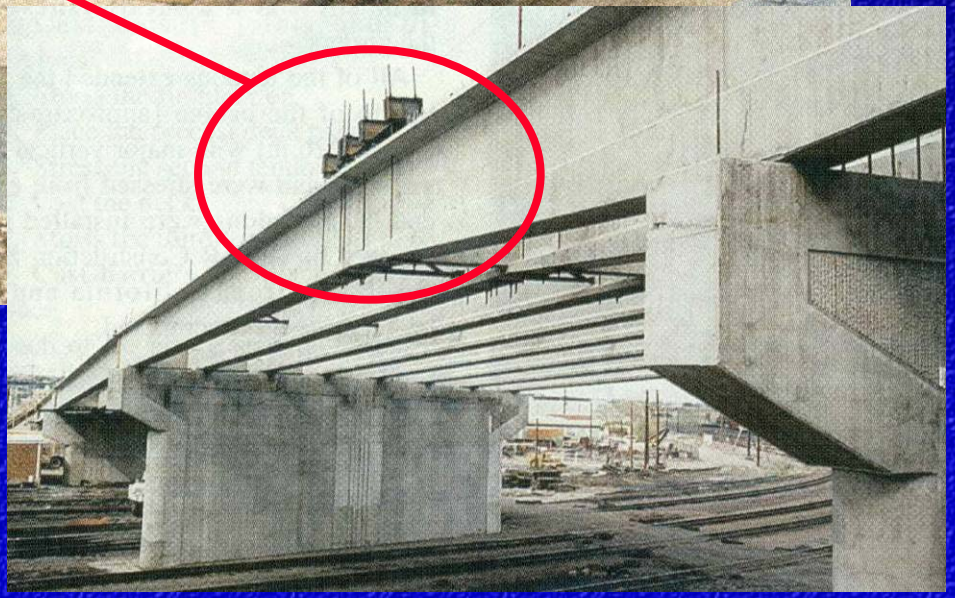


Main Street Viaduct, Pueblo, CO

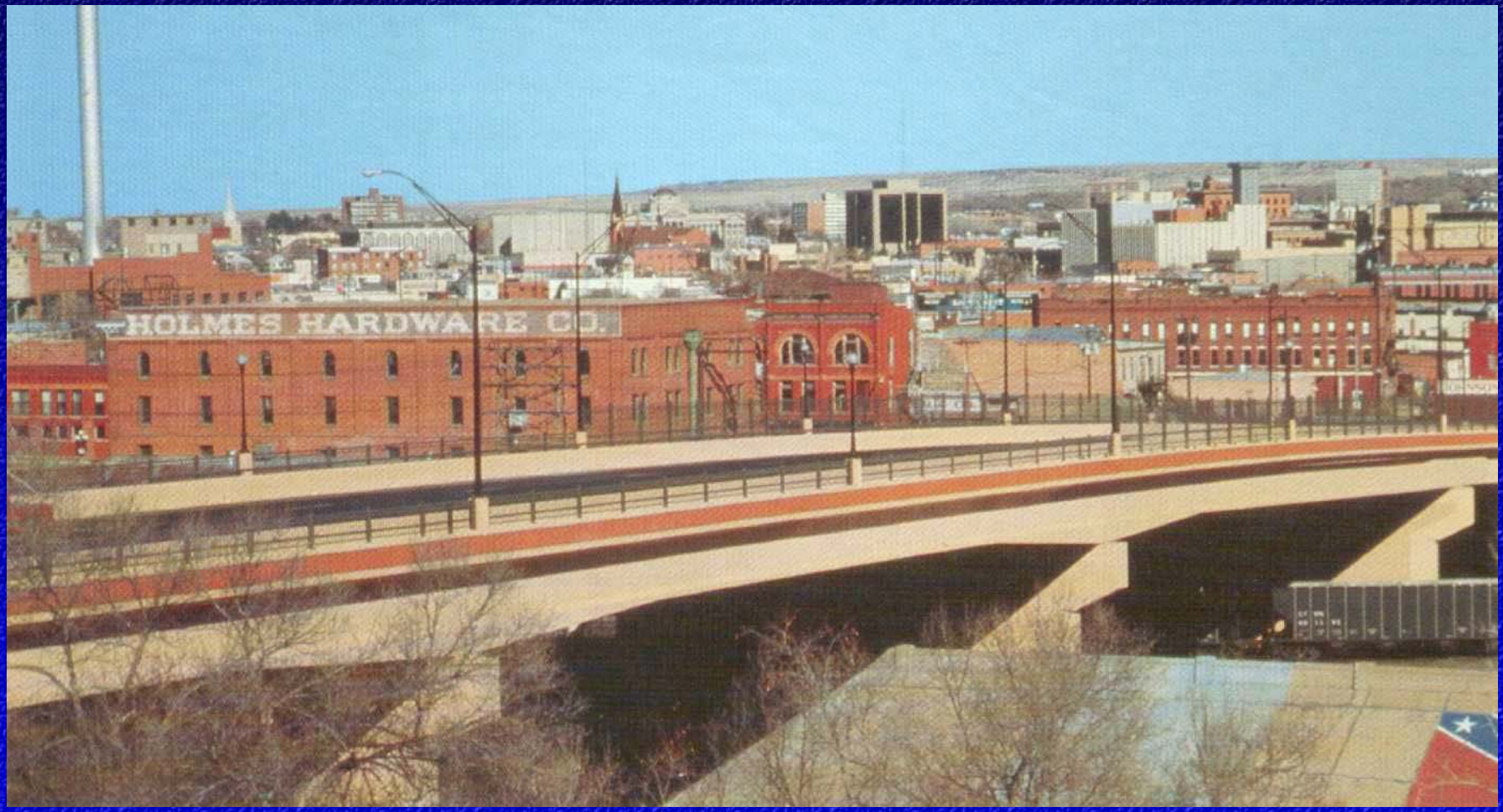


Strongbacks at splices instead of towers





Main Street Viaduct, Pueblo, CO



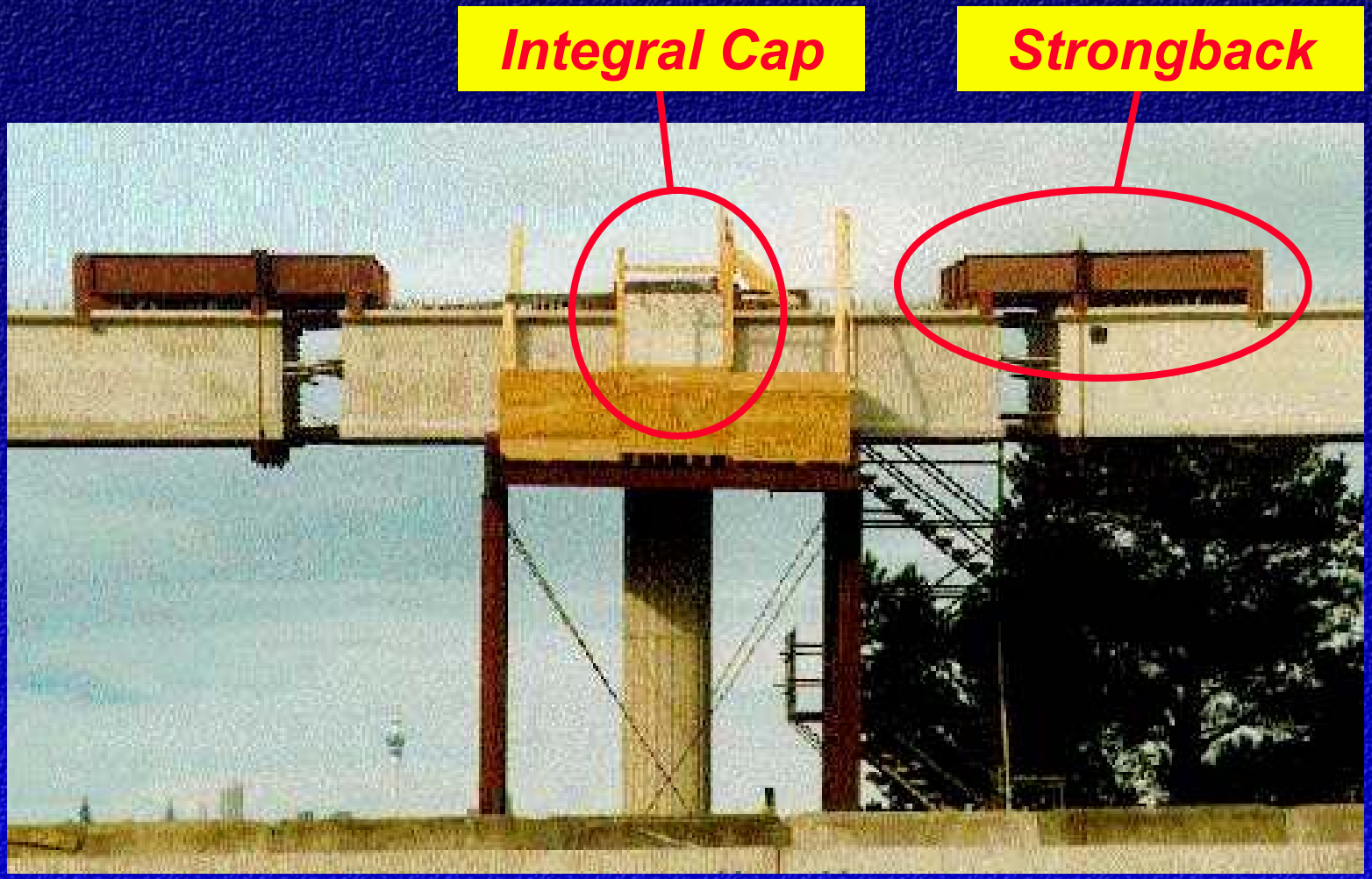
Continuous Span Projects

Rosebank-Patiki Interchange, NZ

- Built in 1997
- 2 - 435 ft spliced girder structures
- Curved ramps with 492 ft radius
- 4 spans with 138 ft max. span
- 6 segments with 2 pier segments
- 71 in. deep girders
- Integral cap to provide continuity between sub- and superstructure

Rosebank-Patiki Interchange, NZ

Rosebank-Patiki Interchange, NZ



Continuous Span Projects

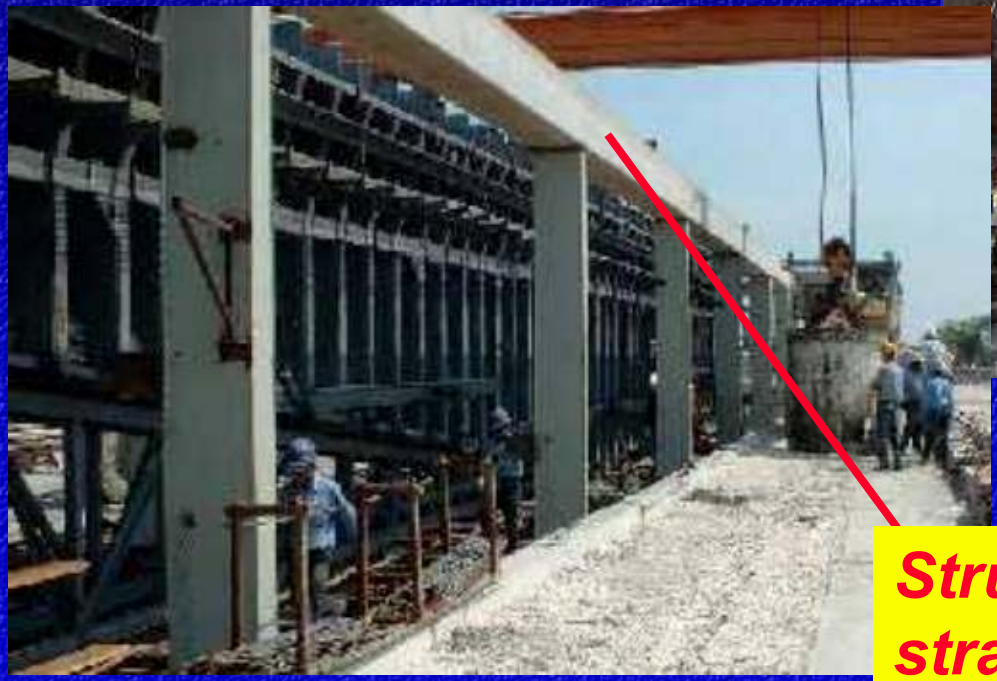
Palm Valley Bridge, FL

- Built in 2002
- 3 spans (210' – 290' – 210' = 710')
- 5 segments in each girder line
- Designed as spliced girder by consultant
- Barge delivery of segments
- Erected on falsework
- Full-length post-tensioned

Palm Valley Bridge, FL

Haunched pier segment:

- Special forms & bed for 15' depth
- 8" web for 3" diam. PT ducts

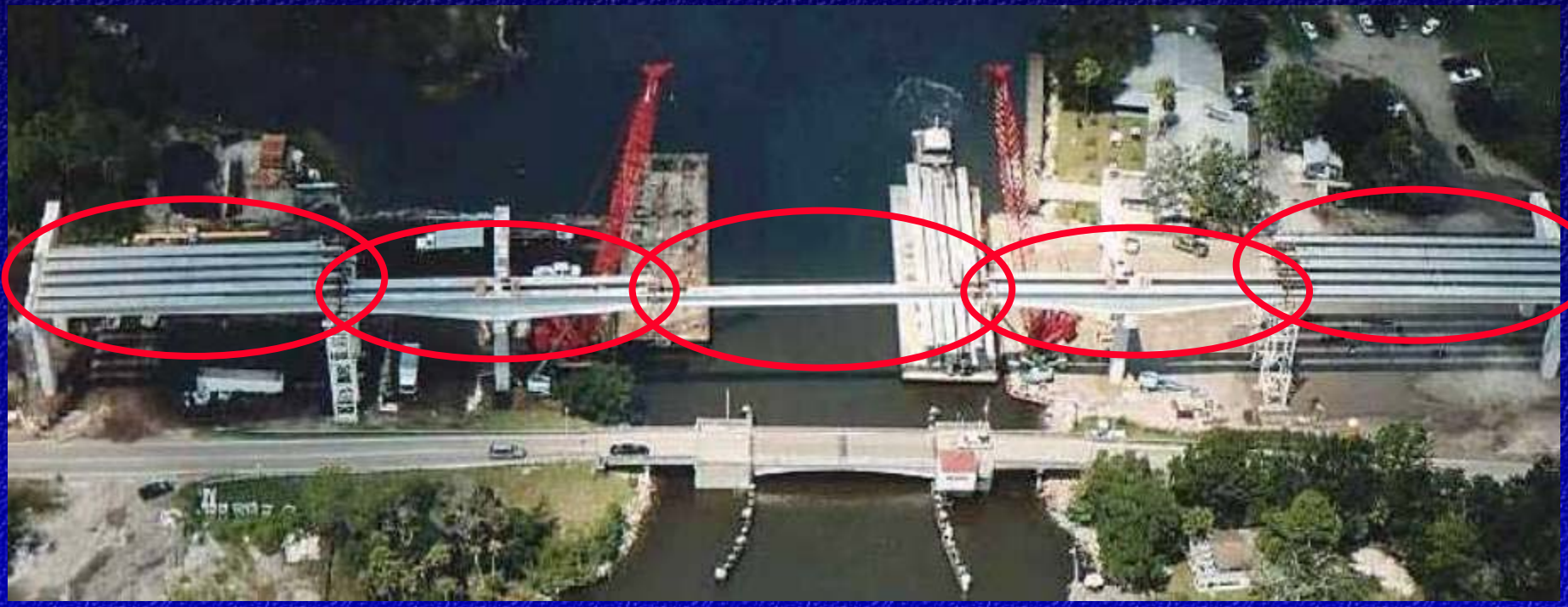


Strut for pretensioned strands in top flange

Palm Valley Bridge, FL

- Haunched pier segment
  - Variable web depth to 15' total depth at pier
  - Bottom flange depth varies slightly

Palm Valley Bridge, FL



- Pier segments: 15' deep, 141' long, 125 tons
- End segments: 81" deep, 139' long, 100 tons
- Drop-in segment: 96" deep, 148' long, 103 tons
- 1'-0" field closure pour between all segments

Palm Valley Bridge, FL

To maintain unobstructed channel

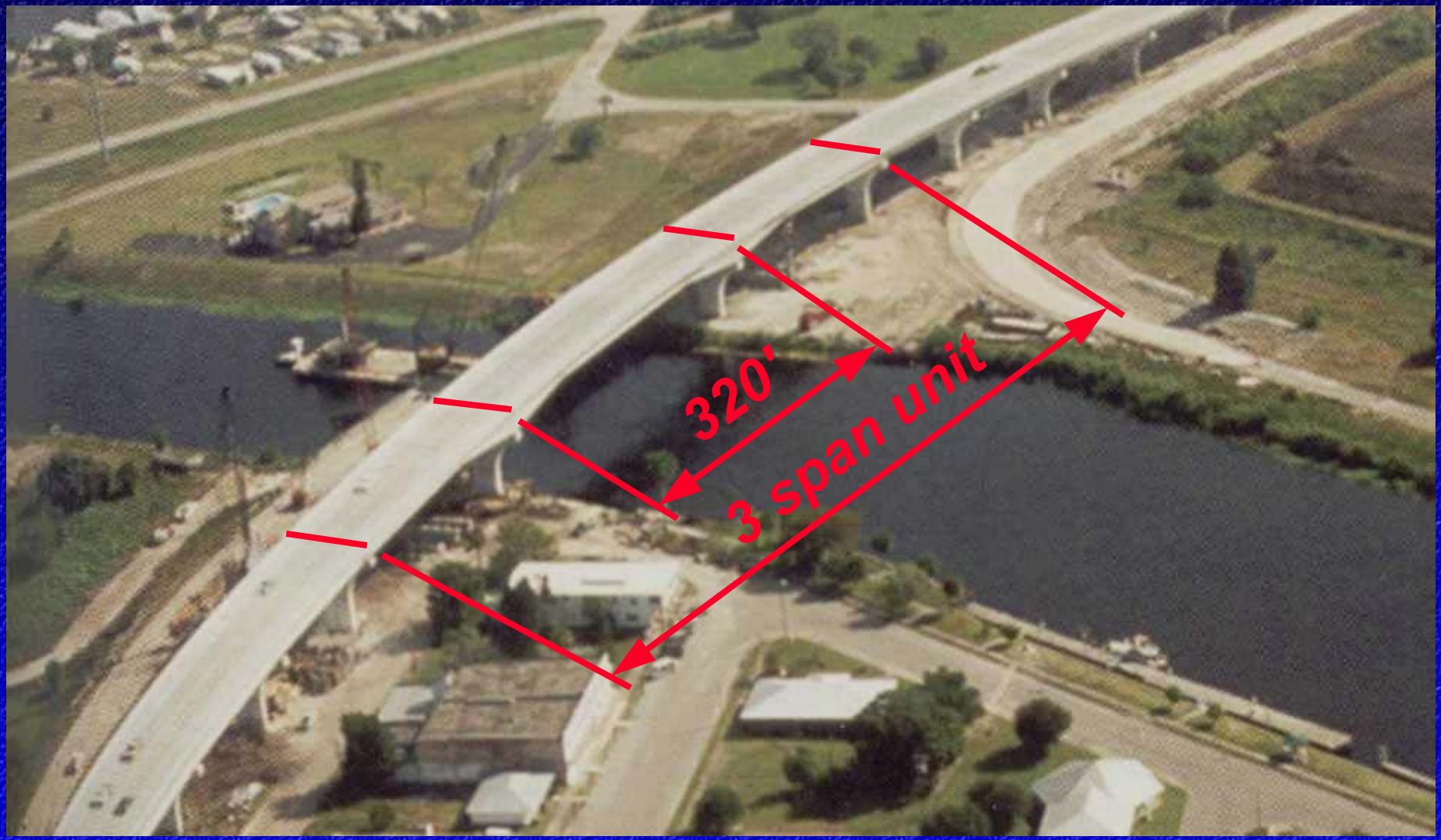
- *Temporary towers in back spans*
- *Strong-backs at splices between segments*

Continuous Span Projects

Moore Haven Bridge, FL

- Built in 2000
- 3 spans with 320 ft max. (RECORD)
- 5 segments with 15 ft deep haunched pier segments
- Barge delivery of segments
- Erected on falsework
- Spliced girder selected by contractor

Moore Haven Bridge, FL



Continuous Span Projects

Route 33 Bridges, West Point, VA

- 2 bridges: Mattaponi and Pamunkey Rivers
- Currently under construction
- Each bridge has two 4-span units with 200'-240'-240'-200' spans
- 8 ft deep girders haunched to 10'-6" deep at piers
- Barge delivery of segments
- Erected on falsework supported by footings

Route 33 Bridges at West Point, VA

- Seven segments to form the 4 spans
- Girders and decks are lightweight concrete

Route 33 Bridges at West Point, VA

Lightweight concrete bulb tee girders

- f'_c = 8,000 psi with max. density of 125 pcf

Lightweight concrete deck

- f'_c = 5,000 psi with max. density of 120 pcf

Lightweight concrete was used to reduce foundation loads

- Estimated 10% reduction in piles for main piers
- Also reduced foundation size

VTRC performing material tests and observing construction

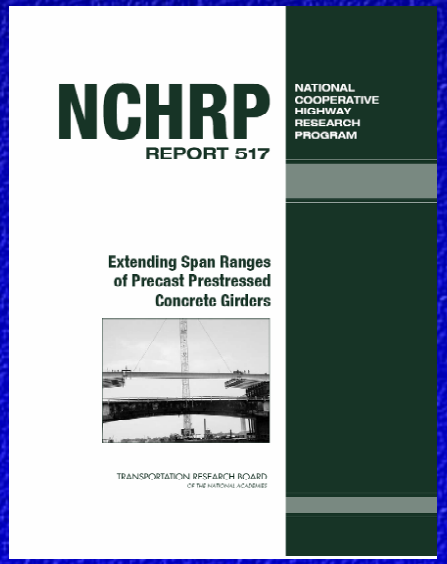
NCHRP Project 12-57
Extending Span Ranges of Precast Prestressed Concrete Girders

NCHRP Report 517 completed October 2003

- Download from
  http://gulliver.trb.org/publications/nchrp/nchrp_rpt_517.pdf

Selected results of research

- List of Spliced Girder Bridges
- Design Examples
- Proposed revisions to Specs



Initial Findings

•Continue

Most design options for extending span ranges involve incremental changes to current design methods and materials

- ***Design options need to be identified***
- ***Additional design guidance not required***

Spliced girders provide significantly increased span ranges for precast prestressed concrete girders

- ***Information is lacking***
- ***Focus of most of the activity in the study***